## Space Weather Forecast

Issued on Monday, 26 February 2024 at 01:12 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Ongoing likelihood of Moderate flares with a slight chance of Strong flares due to a large sunspot region. Chance of G1/Minor Storm intervals on day 1 (26 Feb)**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Moderate, with a solitary Moderate flare, but numerous common-class flares observed from the large sunspot in the northwest disc. This region initially underwent a very slow increase in area but only limited complexity. Despite some opposite magnetic polarities being observed within the same large spots, the strongest areas of these different polarities remain well separated and without too much mixing. This has likely been the cause for generally limited flare activity in the period compared to previous days. There are five other sunspot regions on the disc, however these are all much smaller and simpler.

There were no Earth directed coronal mass ejections (CMEs) observed in available imagery.

**Solar Wind / Geomagnetic Activity:** Solar winds were observed at background to slightly elevated levels, with ongoing but limited influence from a weak, glancing CME that arrived late on 24 Feb. Speeds varied between 350-460km/s. Total Interplanetary Magnetic field (IMF) strength was predominantly moderate. The important north-south component was largely weak to moderately negative (southward) until around 25/1300 UTC, then mainly weak to moderately positive (northward). From approximately 25/2300 UTC the north-south component became weak to moderately negative again. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) reduced from slightly elevated to ambient background levels, with observed values well below the S1 Minor Solar Radiation Storm level.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** Moderate to Low activity is expected with further isolated Moderate-class flares likely. There remains a slight chance of isolated Strong flares from the large region in the northwest disc.

**Solar Wind / Geomagnetic Activity:** Near background solar winds are expected to become elevated on day 1 (26 Feb), resulting from the onset of the fast wind from a coronal hole fast wind, before easing day 2 (27 Feb) onwards towards background levels again. Quiet to Unsettled geomagnetic activity at first, becoming Unsettled to Active with a chance of G1 Minor Storms from the coronal hole fast wind onset on day 1 (26 Feb). Quiet to Unsettled activity expected days 2-4 (27-29 Feb).

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) is expected to remain at background levels, but with a risk of becoming enhanced in the circumstance of any further significant flares from the large sunspot in the northwest disc. This giving a slight chance of exceeding the S1 Minor Radiation Storm level.

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# Met Office Space Weather Forecast

**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 25 | 1 | 1 | 1 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | Yes | 70 | 70 | 70 | 60 |
| Very Active | R3 to R5 X | No | 20 | 20 | 20 | 15 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 20 | 20 | 20 | 20 |
| Very Active | ≥ S3 * | No | 5 | 5 | 5 | 5 |
| * S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$) | | | | | | |

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